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Traditional knowledge digital library: A Magic bullet in the war against biopiracy

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Abstract:-
Traditional Knowledge is not something new or innovative but the distillation of practices or knowledge in the society. India has experienced various initiatives regarding the protection of traditional knowledge under intellectual property rights, including the Traditional Knowledge Digital Library, which is a major step to curb biopiracy and in many of these cases the country had to fight for revocation of the granted patents which involved huge costs and time. India has taken misappropriations of its traditional knowledge by developed countries through patenting system. This paper discusses various aspects of Traditional Knowledge Digital Library of India including its role in the preservation of Traditional Knowledge, protection and dissemination of traditional knowledge, Traditional Knowledge Database and present Status, benefits of TKDL, Examples of Bio-piracy of Indian Traditional Knowledge and major achievements of TKDL in preserving traditional knowledge.

Keywords:- Traditional Knowledge, Digital Library, Biopiracy, TKDL Database, Patents, Intellectual Property Rights, Preservation of Traditional Knowledge.

1. Introduction

Traditional Knowledge Digital Library (TKDL) is a pioneering initiative of India to protect Indian traditional medicinal knowledge and prevent its misappropriation at International Patent Offices. Traditional Knowledge (TK) is a valuable yet vulnerable asset to indigenous and local communities who depend on TK for their livelihood. The healthcare needs of more than 70% population and livelihood of millions of people in India is dependent on traditional medicine. Globally too there has been renewed attention and interest in the use of traditional medicine increasing its vulnerability to exploitation. The grant of a US patent to wound healing properties of turmeric flags the danger of complacence in proactively guarding the traditional knowledge. The time, effort and money spent on revocation of turmeric patent at USPTO highlighted the need for putting in place a proactive mechanism for TK protection. The problem related to Indian TK is further compounded by the fact that India's traditional medicinal knowledge exists in languages such as Sanskrit, Hindi, Arabic, Urdu, Tamil etc. that too in ancient local dialects that are no more in practice. Thus, the published Indian TK literature is neither accessible nor understood by patent examiners at international patent offices.

Traditional Knowledge Digital Library has overcome the language and format barrier by systematically and scientifically converting and structuring the available contents of the ancient texts on Indian Systems of Medicines i.e. Ayurveda, Siddha, Unani and Sowa Rigpa as well as Yoga, into five international languages, namely, English, Japanese, French, German and Spanish, with the help of information technology tools and an innovative classification system - Traditional Knowledge Resource Classification (TKRC). As on date, more than 3.6 lakh formulations/ practices have been transcribed into the TKDL database.

TKRC has structured and classified the Indian Traditional Medicine System into several thousand subgroups for Ayurveda, Unani, Siddha and Yoga. TKRC enabled incorporation of about 200 sub-groups under A61K 36/00 in International Patent Classification instead of few sub-groups earlier available on medicinal plants under A61K 35/00, thus enhancing the quality of search and examination of priorart with respect to patent applications field in the area of traditional knowledge.

TKDL has also set international specifications and standards for setting up of TK databases based on TKDL specifications. This was adopted in 2003 by the Committee in fifth session of the Intergovernmental Committee (IGC) of WIPO on Intellectual Property and Genetic Resources, Traditional Knowledge and Expression of folklore.

TKDL technology integrates diverse disciplines and languages such as Ayurveda, Unani, Siddha, Yoga, Sanskrit, Arabic, Urdu, Persian, Tamil, English, Japanese, Spanish, French, German, modern science & modern medicine. Currently, TKDL is based on books of Indian Systems of Medicine, which are available in open domain and can be sourced by any individual/organization at national/international level. TKDL acts as a bridge between these books (priorart) and International patent examiners.

At present, as per the approval of Cabinet Committee on Economic Affairs, access of TKDL is available to thirteen Patent Offices (European Patent Office, United State Patent & Trademark Office, Japan Patent Office, United Kingdom Patent Office, Canadian Intellectual Property Office, German Patent Office, Intellectual Property Australia, Indian Patent Office, Chile Patent Office, Intellectual Property Corporation of Malaysia, Rospatent- Intellectual Property Office of Russia, Peru Patent Office and Spanish Patent and Trademark Office), under TKDL Access (Non-disclosure) Agreement. As per the terms and conditions of the Access agreement, examiners of patent office can utilize TKDL for search and examination purposes only and

cannot reveal the contents of TKDL to any third party unless it is necessary for the purpose of citation. TKDL Access Agreement is unique in nature and has in-built safeguards on Non-disclosure to protect India's interest against any possible misuse.

In addition, pre-grant oppositions are being filed at various International Patent Offices, along with prior-art evidences from TKDL. Significant impact has already been realized. So far more than 230 patent applications have either been set aside/ withdrawn/ amended, based on the prior art evidences present in the TKDL database without any cost and in few weeks/months of time, whereas APEDA had to spend about seven crores towards legal fee only for getting few claims of Basmati rice patent revoked.

Fig.No:1 Home Page of Traditional Knowledge Digital Library of India

3. Scope and Limitations

The present study will be restricted to analysis of TKDL which is accessible from the official website.

4. Methodology

The study focuses on current status of Traditional Knowledge Digital Library, the researchers' access the TKDL website and literature published on TKDL for collecting information about TKDL as well as its services and milestones.

5. Misappropriation of Traditional Knowledge

The grant of patents on non-patentable knowledge (related to traditional medicines), which is either based on the existing traditional knowledge of the developing world, or a minor variation thereof, has been causing a great concern to the developing world. Some of the examples given in Annex. 1 illustrate the bio-piracy of traditional knowledge and in many of these cases the country had to fight for revocation of the granted patents, Revocation, may not be a feasible option possible for all the patents taken on the traditional knowledge since it involves huge costs and time.

6. Protecting Codified Traditional Knowledge

Patent examiners, in the international patent offices, while examining the patentability of any claimed subject matter, use available resources for searching the appropriate non-patent literature sources. Patent literature, is usually wholly contained in several distinctive databases and can be more easily searched and retrieved whereas non-patent literature prior art is often buried somewhere in the many and diverse sources. Therefore, a need was felt to create more easily accessible non-patent literature databases on traditional knowledge of India.

7. Traditional Knowledge Digital Library - A tool for prevention of misappropriations of traditional knowledge

TKDL contains information from Indian Systems of Medicine, viz., Ayurveda, Unani, Siddha, Sowa Rigpa as well as Yoga available in public domain. For this, traditional knowledge from the existing literature existing in local languages such as Sanskrit, Urdu, Arabic, Persian and Tamil in converted into digitized format, and is available in five international languages including English, German, Spanish, French and Japanese. Traditional Knowledge Resource Classification (TKRC), an innovative structured classification system for the purpose of systematic arrangement, dissemination and retrieval was evolved for about 5,000 subgroups against few subgroups available in International Patent Classification (IPC), related to medicinal plants. The information is structured under section, class, subclass, group and subgroup as per the International Patent Classification (IPC) for the convenience of its use by the international patent examiners. The TKDL database comprises about 3.6 lakh formulations/ practicesthat has been transcribed from ISM and Yoga texts.

Each text is read, medicinal formulation/ practice identified and converted into a structured language using Traditional Knowledge Resource Classification by subject (Ayurveda, Unani,

Siddha, Sowa Rigpa or Yoga) experts. The codes are then filled into the data entry screen. The content (prior art) from ancient texts are also saved in the database. The translated version of all the TKRC codes is ported in the database. The abstraction is done by the subject experts. The codes once saved in meta data directory are converted in different languages based on Unicode technology. The formulations are converted into English, German, French Japanese and Spanish languages. The converted format of the formulation is readable and can be understood in general by all.

TKDL software with its associated classification system i.e., TKRC converts text in local languages into multiple languages as mentioned above. It may be noted that TKDL is not a transliteration, rather it is a knowledge-based conversion, where data abstracted once is converted into several languages by using Unicode, Metadata methodology. Traditional terminology is also converted into modern terminology, for example, Jwar to fever, Turmeric to Curcuma longa, Mussorika to small pox etc.

TKDL includes a search interface providing full text search and retrieval of traditional knowledge information on IPC and keywords in multiple languages. The search features include single or multiple word searches, complex Boolean expression search, Proximity search, Field search, Phrase search, etc in the form of simple and advance search options. Simple search lets the user search a combination of keywords. Advance search lets the user search using Boolean expressions, using the expressions like “near”, “and”, “and not”. Searches are also available on IPC and TKRC codes.

TKDL acts as a bridge between formulations existing in local languages and a Patent Examiner at a global level, since the database will provide information on modern as well as local names in a language and format understandable to Patent Examiners. It is expected that the issue of the gap on lack of access to prior art traditional knowledge shall get addressed.

8. Some examples of bio-piracy of traditional knowledge

8.1 Turmeric (Curcuma longa Linn.)

The rhizomes of turmeric are used as a spice for flavouring Indian cooking. It also has properties that make it an effective ingredient in medicines, cosmetics and dyes. As a medicine, it has been traditionally used for centuries to heal wounds and rashes.

In 1995, two expatriate Indians at the University of Mississippi Medical Centre (Suman K. Das and Hari Har P. Cohly) were granted a US patent (no.5, 401,504) on use of turmeric in wound healing. The Council of Scientific & Industrial Research (CSIR), India, New Delhi filed a re-examination case with the US PTO challenging the patent on the grounds of existing of prior art. CSIR argued that turmeric has been used for thousands of years for healing wounds and rashes and therefore its medicinal use was not a novel invention. Their claim was supported by documentary evidence of traditional knowledge, including ancient Sanskrit text and a paper

published in 1953 in the Journal of the Indian Medical Association. Despite an appeal by the patent holders, the US PTO upheld the CSIR objections and cancelled the patent. The turmeric case was a landmark judgment case as it was for the first time that a patent based on the traditional knowledge of a developing country was successfully challenged. The US Patent Office revoked this patent in 1997, after ascertaining that there was no novelty; the findings by innovators having been known in India for centuries.

8.2 Neem (Azadirachta indica A. Juss.)

Neem extracts can be used against hundreds of pests and fungal diseases that attack food crops; the oil extracted from its seeds can be used to cure cold and flu; and mixed in soap, it provides relief from malaria, skin diseases and even meningitis. In 1994, European Patent Office (EPO) granted a patent (EPO patent No.436257) to the US Corporation W.R. Grace Company and US Department of Agriculture for a method for controlling fungi on plants by the aid of hydrophobic extracted Neem oil. In 1995, a group of international NGOs and representatives of Indian farmers filed legal opposition against the patent. They submitted evidence that the fungicidal effect of extracts of Neem seeds had been known and used for centuries in Indian agriculture to protect crops, and therefore, was unpatentable. In 1999, the EPO determined that according to the evidence all features of the present claim were disclosed to the public prior to the patent application and the patent was not considered to involve an inventive step. The patent granted on was Neem was revoked by the EPO in May 2000. EPO, in March 2006, rejected the challenge made in 2001 by the USDA and the chemicals multinational, W. R. Grace to the EPO's previous decision to cancel their patent on the fungicidal properties of the seeds extracted from the neem tree.

8.3 Basmati Rice (Oryza sativa Linn.)

Rice Tec. Inc. had applied for registration of a mark "Texmati" before the UK Trade Mark Registry. Agricultural and Processed Food Exports Development Authority (APEDA) successfully opposed it. One of the documents relied upon by Rice Tec as evidence in support of the registration of the said mark was the US Patent 5,663,484 granted by US Patent Office to Rice Tec on September 2, 1997 and that is how this patent became an issue for contest.

This US utility patent was unique in a way to claim a rice plant having characteristics similar to the traditional Indian Basmati Rice lines and with the geographical delimitation covering North, Central or South America or Caribbean Islands. The US PTO granted the patent to Rice Tec on September 2, 1997. The said patent covered 20 claims covering not only novel rice plant but also various rice lines; resulting plants and grains, seed deposit claims, method for selecting a rice plant for breeding and propagation. Its claims 15-17 were for a rice grain having characteristics similar to those from Indian Basmati rice lines. The said claims 15-17 would have come in the way of Indian exports to US, if legally enforced.

Evidence from the IARI (Indian Agricultural Research Institute) Bulletin was used against claims 15-17. The evidence was backed up by the germplasm collection of Directorate of Rice Research, Hyderabad since 1978. CFTRI(Central Food Technological Research Institute) scientists evaluated the various grain characteristics and accordingly the claims 15-17 were attacked on the basis of the declarations submitted by CFTRI scientists on grain characteristics.

Eventually, a request for re-examination of this patent was filed on April 28, 2000. Soon after filling the re-examination request, Rice Tec chose to withdraw claims15-17 along with claim 4.Biopiracy of traditional knowledge is not limited to India alone. In fact, there have been several examples from other countries where traditional knowledge biopiracy has become a concern. Some of these examples are given below:

8.4 Kava (Piper methysticum Forster)

Kava is an important cash crop in the Pacific, where it is highly valued as the source of the ceremonial beverage of the same name. Over 100 varieties of Kava are grown in the Pacific, especially in Fiji and Vanuatu, where it was first domesticated thousands of years ago. In North America and Europe, Kava is now promoted for a variety of uses. French company L'Oreal - a global giant with US $10 billion a year in sales - patented the use of Kava to reduce hair loss and stimulate hair growth.

8.5 Ayahuasca (Banisteriopsis caapi Mort.)

For generations, Shamans of indigenous tribes throughout the Amazon basin have processed the bark of B. caapi Mort. to produce a ceremonial drink known as “Ayahuasca”. The Shamans use Ayahuasca (which means “wine of the soul”) in religious and healing ceremonies to diagnose and treat illness, meet with spirits, and divine the future.

American, Loren Miller obtained US Plant Patent (no.5, 751 issued in 1986), granting him rights over an alleged variety of B. caapi Mort. which he had collected from a domestic garden in Amazon and had called “Da Vine”, and was analyzing for potential medicinal properties. The patent claimed that Da Vine represented a new and distinct variety of B. caapi Mort., primarily because of the flower colour.

The Coordinating Body of Indigenous Organisations of the Amazon Basin (COICA), which represents more than 400 indigenous tribes in the Amazon region, along with others, protested about a wrong patent that was given on a plant species. They protested that Ayahuasca had been known to natives of the Amazon rainforest and it is used in traditional medicine and cultivated for that purpose for generations, so Miller could not have discovered it , and should not have been granted such rights, which in effect, appropriated indigenous traditional knowledge. On reexamination, USPTO revoked this patent on 3rd November 1999. However, the inventor was able to convince the USPTO on 17th April 2001, and the original claims were reconfirmed and the patent rights restored to the innovator.

8.6 Quinoa (Chenopodium quinoa Willd.)

Quinoa is a staple food crop for millions in the Andes, especially Quechua and Aymara people who have bred a multitude of quinoa varieties. One traditional quinoa variety, Apelawa, is the subject of US patent 5,304,718 held by two professors from Colorado State University who claim the variety's male sterile cytoplasm is key to developing hybrid quinoa. The patent claims any quinoa crossed with male sterile Apelawa plants.

8.7 Hoodia (Hoodia gordonii (Masson) Sweet ex Decne)

For thousands of years, African tribesmen have eaten the Hoodia cactus to stave off hunger and thirst on long hunting trips. The Kung bushmen, San who live around the Kalahari desert in southern Africa used to cut off a stem of the cactus about the size of a cucumber and munch it.

In 1995, South African Council of Scientific & Industrial Research (CSIR) patented Hoodia's appetite-suppressing element (P57) and hence, its potential cure for obesity. In 1997 they licensed P57 to British Biotech Company, Phytopharm. In 1998, Pfizer acquired the rights to develop and market P57 as a potential slimming drug and cure for obesity (a market worth more than £ 6 billion), from Phytopharm for $ 32 million. The San people eventually learned of this exploitation of their traditional knowledge, and in June 2001, launched legal action against South African CSIR and the pharmaceutical industry on grounds of bio-piracy. They claimed that their traditional knowledge has been stolen, and the South African CSIR had failed to comply with the rules of the Convention on Biodiversity, which requires the prior informed consent of all stakeholders, including the original discoverers and users.

Phytopharm conducted extensive enquiries but were unable to find any of the knowledge holders. The remaining San were apparently at the time living in a tented camp 1500 miles away from their tribal lands. The South African CSIR claimed that they have planned to inform the San of the research and share the benefits, but wanted to make sure that the drug proved successful.

The two sides entered into negotiations for a benefit-sharing agreement, despite complications regarding who should be compensated: the person who originally shared the information, their descendants, the tribe, or the entire country. The San are nomads spread across four countries.

However, in March 2002, a landmark agreement was reached in which the San were to receive a share of any future royalties. Since then however, hoodia has made entry into the gray market and to what extent the San community is aided from the benefit sharing remains to be seen.

8.8 Other examples

Phyllanthus amarus Schum.et Thonn. is used for Ayurvedic treatment for jaundice. A US patent has been taken for use against Hepatitis B. The plant Piper nigrum Linn. is used for Ayurvedic treatment for vitiligo (a skin pigmentation disorder). A patent has been taken in UK for the application of a molecule from Piper nigrum Linn. for use in treatment of vitiligo.

The appropriation of elements of this collective knowledge of societies into proprietary knowledge for the commercial profit of a few is a major concern. Urgent action is needed to protect these fragile knowledge systems through national policies and international understanding linked to IPR, while providing its development and proper use for the benefit of its holders. What is needed is a particular focus on community knowledge and community innovation, enterprise and investment is particularly important.

The local communities or individuals do not have the knowledge or the means to safeguard their property in a system, which has its origin in very different cultural values and attitudes. The communities have a storehouse of knowledge about their flora and fauna, their habits, their habitats, their seasonal behaviour and the like-and it is only logical and in consonance with natural justice that they are given a greater say as a matter of right in all matters regarding the study, extraction and commercialization of the biodiversity. A policy that does not obstruct the advancement of knowledge, and provides for valid and sustainable use and adequate intellectual property protection with just benefit sharing is what is needed.

9. TKDL Outcomes against Bio-Piracy

Beginning July 2009, TKDL team has identified several patent applications at international patent offices like United States Patent and Trademark Office(USPTO), European Patent Office (EPO), Canadian Intellectual Property Office (CIPO), German Patent and Trade Mark Office (DPMA), United Kingdom Patent & Trademark Office (UKPTO), IP Australia and Controller General of Patents Designs and Trademarks (CGPDTM, India), with respect to Indian Systems of Medicine. In these cases, prior-art evidences from Traditional Knowledge Digital library have been filed at pre-grant stage under relevant provisions at these patent Offices. In a number of cases like those listed below, patent applications have either been withdrawn/cancelled/declared dead/terminated or have had claims amended by applicants or rejected by the Examiner(s) on the basis of TKDL submissions.

Table No.1 TKDL Outcomes against Bio-Piracy

S.No	Patent Office	No. of Cases
1.	European Patent Office (EPO)	132
2.	United States Patent and Trademark Office (USPTO)	26

3.	Controller General of Patents Designs and Trademarks (CGPDTM)	36
4.	Canadian Intellectual Property Office (CIPO)	36
5.	IP Australia (AIPO)	10
6.	United Kingdom Patent & Trademark Office (UKPTO)	1
	Total	**241**

10. Source of Information

The Traditional Knowledge Digital Library (TKDL) is a database currently containing codified/published literature from Indian Systems of Medicine. TKDL contains more than 3.6 lakh formulations from the texts of traditional medicine systems of India including Ayurveda, Unani and Siddha. The selection of these books is based on inputs from a set of eminent experts from each stream of medicine. The task of digitizing the medicinal information available is being done continuously in a phased manner and has started with open knowledge available in published books.

Time of origin as mentioned, refers to the lifetime of authors of the respective books.

In case of compiled books, the time of origin is not given since it is dependent upon the time of origin of back-references from which information is taken.

The list of books from which knowledge is currently available in the TKDL database is listed below differentiated by the Indian traditional system of medicine:

Table No 2. Sources available in TKDL

Sr.No	Discipline	No. of texts (including volumes) used for transcription
1	Ayurveda	119
2	Unani	55
3	Siddha	91
4	Sowa Rigpa	1
5	Yoga	15
	Total	**281**

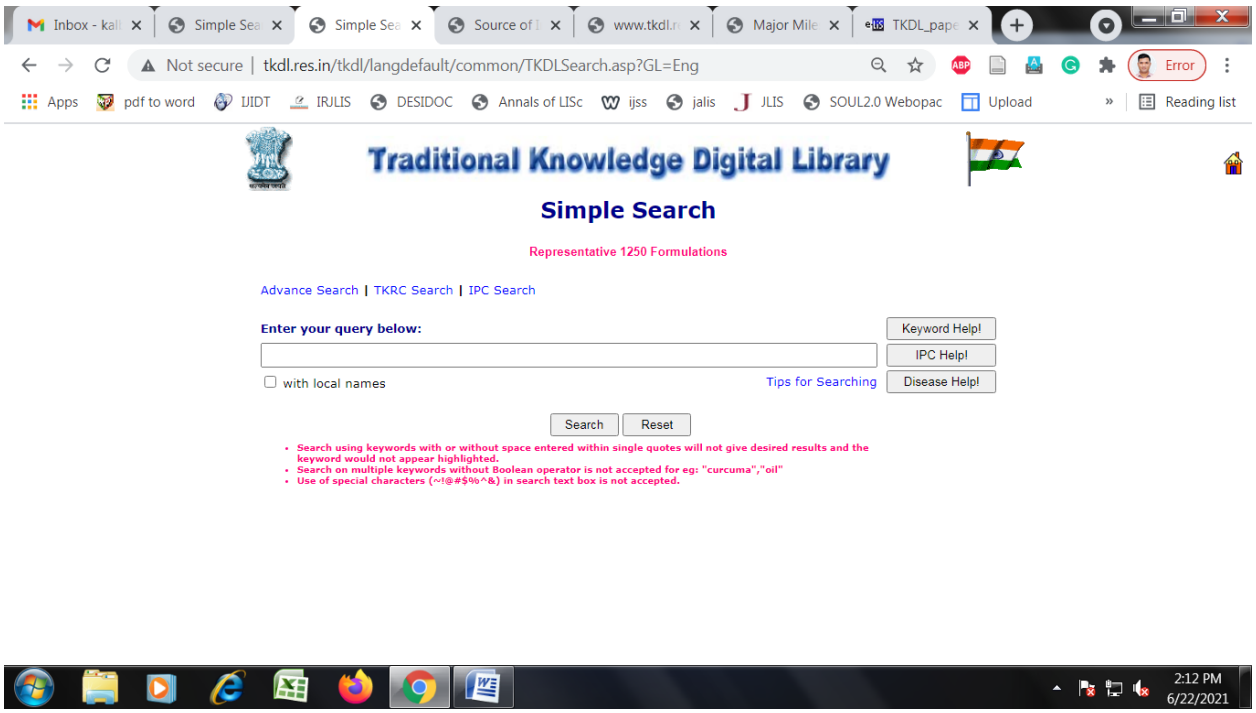

Fig. No.02 Search Interface of TKDL

11. Major Milestones

Table No: 3 Major Milestones of TKDL

Sr.No	Milestones of TKDL
1.	**October,1999;December 1999** Approach paper on setting up of TKDL; Submission of approach paper to Standing Committee on Information Technology (SCIT), World Intellectual Property Organisation (WIPO).
2.	**January, 2000** Setting up of the interdisciplinary (inter-ministerial Task Force on TKDL.
3.	**May, 2000** Submission of TKDL Task Force Report to Department of Indian System of Medicine and Homeopathy; and presenting TKDL Concept & Vision at International forum.
4.	**January 2001** Cabinet Committee of Economic Affairs (CCEA's) approval for the TKDL Project.
5.	**June, 2001** Memorandum of Understanding (MoU) between Department of ISM&H now AYUSH) and National Institute of Science Communication (now CSIR-National Institute of Science Communication and Information Resources).
6.	**July, 2001** Development of TKDL software, specifications and design.
7.	**October, 2001 to March, 2002** Establishing TKDL team of Project Assistants (IT), Ayurveda, Patent Examiners, etc.

8.	**February, 2001** Presentation on Traditional Knowledge Resource Classification (TKRC) at International Patent Classification (IPC) Union for getting established WIPO-TK Task Force consisting of USPTO, EPO, JPO, China and India.
9.	**February, 2002** WIPO-TK Task Force recommended addition of a new subclass under A 61; Committee of Experts recommended: (i) inclusion of approx. 200 subgroups on TK against earlier few sub-groups on medicinal plants, (ii) linking of TKRC to IPC and (iii) continuation of work on biodiversity, TK and TCE.
10.	**November - December, 2002; July, 2003** Internationally recognized specifications and standards for setting up of TK databases and registries based on TKDL specifications, their drafting presentation and adoption of recommendations at the 5th Session of IGC.
11.	**August, 2002** Constitution of Access Policy Issue Committee (APIC).
12.	**March, 2003** First batch of data abstraction work on 36,000 Ayurveda formulations for creating TKDL in five languages, i.e. English, German, Spanish, French and Japanese.
13.	**October, 2003** Release of demo TKDL CD containing a sample of 500 formulations.
14.	**June 2004** Initiation of the TKDL Unani project.
15.	**August 2004** Initiation of TKDL Ayurveda Phase II.
16.	**October, 2004** Concordance between IPC and TKRC and approval on linking of TKRC with IPC.
17.	**August, 2005** Initiation of project on TKDL Siddha. Creating of TKRC containing approx. 25,000 subgroups.
19.	**June 2006** Approval on Access to TKDL database to international patent offices by Cabinet Committee on Economic Affairs.
20.	**January 2008** Initiation of activities on creation of TKDL Yoga.
21.	**February 2009** TKDL Access Agreement with European Patent Office (EPO).
22.	**July 2009** TKDL Access Agreement with USPTO.
23.	**July 2009** The first prior art evidence based on TKDL citations under Third Party observations against 35 patent applications submitted to EPO leading to development of a formalised structure for filing Third Party Objections (TPOs)/oppositions at various international patent offices.
24.	**October, 2009** TKDL Access Agreement with German Patent and Trademark Office (DPMA).
25.	**February, 2010**

	TKDL Access Agreement with United Kingdom Intellectual Property Office. TKDL Access Agreement with Canadian Intellectual Property Office (CIPO).
26.	**January, 2011** TKDL Access Agreement with Intellectual Property Australia (IP Australia).
27.	**March 22-24, 2011** International Conference on 'Utilization of the Traditional Knowledge Digital Library (TKDL) as a Model for the Protection of Traditional Knowledge.
28.	**April, 2011** TKDL Access Agreement with Japan Patent Office (JPO).
29.	**July, 2012** First Amending Agreement to TKDL Access Agreement with European Patent Office (EPO).
30.	**August, 2012** First Amending Agreement to TKDL Access Agreement with Canadian Intellectual Property Office (CIPO).
31.	**January, 2014** First Amending Agreement to TKDL Access Agreement with United Kingdom Intellectual Property Office (IPO).
32.	**May, 2014** TKDL Access Agreement with Chile Patent Office (INAPI).
33.	**June, 2014** First Amending Agreement to TKDL Access Agreement with Japan Patent Office (JPO).
34.	**October 2015** TKDL Access Agreement with Intellectual Property Corporation of Malaysia (MyIPO)
35.	**June, 2017** TKDL Access Agreement with Rospatent (Russia).
36.	**June, 2017** TKDL Access Agreement with INDECOPI (Peru).
37.	**October 2017** First Amending Agreement to TKDL Access Agreement with Chile Patent Office (INAPI).
38.	**September 2018** Initiation of Project on Ayurveda from Kerala manuscripts.
39.	**October 2018** Initiation of Project on Sowa Rigpa.
40.	**April 2019** TKDL Access Agreement with Spanish Patent and Trademark Office.

12. Conclusion:-

Traditional Knowledge Digital Library is proving to be an effective deterrent against bio-piracy and has been recognized internationally as a unique effort. Traditional Knowledge Digital Library has set a benchmark in Traditional Knowledge protection around the world, particularly in Traditional Knowledge rich countries, by demonstrating the advantages of proactive action

and the power of strong deterrence. The key here is preventing the grant of wrong patents by ensuring access to Traditional Knowledge related prior art for patent examiners without restricting the use of traditional knowledge.

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